THE PARTNERSHIP FOR THE ASSESSMENT OF READINESS FOR COLLEGE AND CAREERS (PARCC):

ACCESSIBILITY GUIDELINES FOR ITEM DEVELOPMENT*

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THE PARTNERSHIP FOR THE ASSESSMENT OF READINESS FOR COLLEGE AND CAREERS (PARCC):

ACCESSIBILITY GUIDELINES

OVERVIEW OF PARCC'S COMMITMENT TO ACCESSIBLE ASSESSMENT DESIGN

PARCC is committed to providing all students with equitable access to high-quality, 21st-century PARCC assessments. For the system as a whole, PARCC will consider how its assessments will be accessible to all participating students, including English learners (EL) and students with disabilities (SWD), and then include appropriate accommodations (as defined in the NIA) for SWD and ELs. Accessible assessments will allow all individuals taking the assessments to participate and engage in a meaningful and appropriate manner, with the goal being to ensure that results are valid for each and every student. The results will yield information that supports valid inferences about the performance of students with diverse characteristics, and does not mask what students really know and can do.

Through a combination of Universal Design principles and computer-embedded supports, PARCC intends to design an inclusive assessment system. PARCC will also comply with section 508 guidelines. With this model, accessibility is considered from the beginning of initial design through item development, field-testing, and implementation, rather than trying to retrofit the assessments for SWD and ELs. Assessments that have been designed without the benefit of Universal Design have focused primarily on promoting accessibility after-the-fact, resulting in the need to provide many more accommodations and a consequent need for increased test administration resources at the school level. Additionally, as the number of accommodations increases, so does the possibility of implementation infidelity. While external accommodations may be needed for some students to demonstrate what they know and can do, embedded accessibility supports addressed during design and item development minimize the need for accommodations during testing. Embedded accessibility supports at the item level, that do not shift the construct being measured, will become a feature of the assessment for potential use by *all* children.

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UNIVERSAL DESIGN

Universal design provides a framework for curriculum design, instructional processes, and assessment that gives all students equal opportunities to learn and to demonstrate what they have learned. The driving purpose behind Universal Design is to open up access to the greatest number of students without the need for individualized design, accommodations, or modifications. Based on neurological research, Universal Design recognizes that learning is different for each individual, and therefore, for optimal learning to occur, a variety of methods and materials to implement, support and measure learning are needed. Universal Design builds flexibility for learners into curriculum and assessment at the development stage, which enhances teachers' ability to make adjustments for a broader range of students during classroom instruction. Most importantly, all learners benefit from Universal Design— including students who are gifted and talented, English language learners, students with physical, cognitive, and/or sensory disabilities, students with emotional or language/learning disabilities, learners who may be a part of more than one of these types of learners, and students without disabilities. In fact, Universal Design in education is analogous to Universal Design in architecture, where, for example, ramps and curb cuts designed for people in wheelchairs are now considered essential by people without disabilities, such as parents pushing strollers or people moving heavy furniture.[1]

Universal Design and Assessment

According to Thurlow, et al.,

> "Universally designed assessment‖ are designed and developed from the beginning to allow participation of the widest possible range of students, and to result in valid inferences about performance for all students who participate in the assessment.   Universally designed assessments are based on the premise that each child in school is a part of the population to be tested, and that testing results must not be affected by disability, gender, race, or English language ability. Universally designed assessments are not intended to eliminate individualization, but they may reduce the need for accommodations and various alternative assessments by eliminating access barriers associated with the tests themselves."[2]

Universal Design focuses on the understanding that in order to increase access, assessment designers cannot use a "one size fits all" model, but instead must open up opportunities for choice and create multiple alternatives for individuals. Under these principles, item writers must consider the full range of

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[1] Maryland State Board of Education. (2011). "A Route for Every Learner Report."

[2] Thompson, S. J., Johnstone, C. J., & Thurlow, M. L. (2007). *Universal design applied to large scale assessments* (Synthesis Report 44). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes. Retrieved [today's date], from the World Wide Web: http://education.umn.edu/NCEO/OnlinePubs/Synthesis 44.html

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students in the assessment population and write items/tasks/prompts/etc. to measure the construct and reach the greatest number of students without need for accommodation or adaptation. Guided by Universal Design, assessment writers minimize the number of accommodations necessary after the assessment is developed, but acknowledge that the need for accommodations cannot be removed entirely, and therefore the assessment must be designed to meet specific access needs of students.

The following should be considered regarding Universal Design and assessments:

- Item writers apply Universal Design principles from the outset to reduce the number of testing accommodations that are currently being used and that sometimes impact assessment validity (e.g., adult readers and scribing) by building the supports into the assessment design.
- Assessments should be flexible and allow for options that will measure the intended construct equitably for all students.
- Assessments should measure relevant knowledge and filter out non-relevant obstacles.
- Test items should be reviewed using the lens of the Universal Design framework to improve accuracy and accessibility.[3]

Additional elements necessary for universally designed assessments:

- There is an inclusive assessment population. The item or task respects the diversity of the assessment population and allows the full range of eligible students to respond to the item/stimulus.
- Constructs have been precisely defined. The item or task measures what it intends to measure.
- Assessments contain accessible, non-biased items.
- Assessments are designed to be amenable to accommodations
- Instructions and procedures are simple, clear, and intuitive.
- Assessments are designed for maximum readability, comprehensibility, and legibility. [4]
- The item or task material uses a clear and accessible text format.
- The item or task material uses clear and accessible visual elements (when essential to the item).
- The item or task material uses text appropriate for the intended grade level.
- Decisions will be made to ensure that items and tasks measure what they are intended to measure for EL students with different levels of English proficiency and/or first language proficiency.
- All embedded supports have been considered that may increase access while preserving the targeted construct.
- Multiple means of presentation, expression, and engagement have been considered with regard to individual items/tasks for both SWD and ELs.
- Changes to the format of an item will be considered to preserve the item/task meaning or difficulty.

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[3] A Route for Every Learner Report; Maryland State Department of Education

[4] Thompson, Johnstone, & Thurlow (2002). The National Center for Educational Outcomes (NCEO).

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PARCC understands that the goal for the assessments is to be accessible for all students, however we also recognize that in order to assess the full range of the CCS, it is possible that some items or stimuli will not allow for translation into alternate formats. PARCC will address these issues in the Common Accommodations Manual.

GENERAL GUIDELINES FOR DEVELOPING ACCESSIBLE ITEMS AND TASKS

In order to ensure accessibility and consistency in implementation, item writers must refer both to the PARCC Accessibility Guidelines and the PARCC Style Guide [insert link when available].

"Accessibility Principles for Reading Assessments" – NARAP[5]

Principle 1: Assessments are accessible to all students in the population, including students with disabilities.

- Guideline 1-A: Understand and account for the range of student characteristics and experiences that impact reading when designing assessments.
    - *Example:* Test developers should ensure that their item writers know about the range of characteristics of the students who will be taking the items they develop.

- Guideline 1-B: Begin the development of assessments by applying elements of Universal Design
    - *Example:* Among the elements that underlie universally designed assessments are precisely define constructs; nonbiased items; and simple, clear, and intuitive instructions and procedures.

- Guideline 1-C: Use technologies and other evidence-based approaches to provide all students with a variety of assessment options within a similar testing experience.

- Guideline 1-D: Document decisions that are made to make tests more accessible, and monitor the effects for different groups of students.

Principle 2: Assessments are grounded in definitions of reading and mathematics that are composed of clearly specified constructs, informed by scholarship, supported by empirical evidence, and attuned to accessibility concerns.

- Guideline 2-C: Use criteria to select texts that represent different genres and promote the use of interesting passages and/or scenarios that are likely to engage all students, [in accordance with the Common Core State Standards (CCSS).]

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[5] Thurlow, M. L., Laitusis, C. C., Dillon, D. R., Cook, L. L., Moen, R. E., Abedi, J., & O'Brien, D. G. (2009). *Accessibility principles for reading assessments.* Minneapolis, MN: National Accessible Reading Assessment Projects.
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- Guideline 2-D: Use criteria to determine the visual elements that will be included within items/tasks/texts while avoiding distracting elements that impact students' comprehension.
  - Criteria should be developed that outline when visual elements are retained or removed and why.
  - *Example*. A criterion states may use to determine whether a visual element should be retained is to determine if the visual is important to understanding the concepts discussed in the passage. For example, if the author has included a picture or map to help readers understand a concept that is key to the passage or explained in the text, then the visual element should be retained. If such a visual is retained, it is very important that care be taken to provide an accurate description of the visual element that can be accessed by an examinee with a visual impairment. A second criterion states may use to retain a visual element is if it appears to enhance a reader's motivation. Examples of this include the fact that many authors of passages used in assessments secure photos or artistic drawings to help readers connect better with characters or settings in narrative texts or events or concepts in expository texts. Authors also use visual elements to help break up the text for the reader, thus reducing some anxiety about reading long sections of text, helping readers sustain their efforts. In situations where visual elements are used for the purpose of motivation or reduction of anxiety, it is important that the needs of examinees who are blind or visually impaired be considered. If the introduction of a visual element, or retention of a visual with the original text will make the task more difficult for these students than for students without a disability, an alternative to the visual should be considered.

Principle 3: Assessments are developed with accessibility as a goal throughout rigorous and well-documented test design, development, and implementation procedures.

- Guideline 3-A: Initial test design considers the characteristics of all test takers.

- Guideline 3-B: Item development and evaluation considers the characteristics of all test takers.
  - Item writer and task developers should be well-trained regarding the varying needs of test takers and should have ready access to specialists who can clarify population needs.

Principle 4: Assessments reduce the need for accommodations, yet are amenable to accommodations that are needed to make valid inferences about a student's proficiencies.

- Guideline 4-A: Begin the assessment development or revision process by reviewing allowed accommodations to determine whether they could be incorporated into the design of the assessment.

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- Guideline 4-B: Identify and determine the essential accommodations that are still needed after incorporating as many as possible into the assessment.
    - *Example.* A paper-and-pencil version of a computerized assessment might be needed for students who require magnification too high to be feasible for scrolling and other navigation requirements. Some students might need separate settings or multiple-day testing, both of which are considered to be accommodations in many states.

For additional guidance as to the inclusiveness of the assessment, please refer to the PARCC Bias & Sensitivity Guidelines.

BASIC GUIDELINES FOR WRITING ITEMS:**

Note: PARCC has committed to using permissioned text for the English language arts/literacy assessments, and therefore no language adaptations for passages will be made during the item writing process.

In order to ensure accessibility and consistency in implementation, item writers must refer both to the PARCC Accessibility Guidelines and the PARCC Style Guide [insert link when available].

Excerpt from *"Smarter Balanced Assessment Consortium: General Accessibility Guidelines"* – *Measured Progress/ETS Collaborative*[6]

- Present all instructions and procedures using simple, clear, and easy-to-understand language
- Keep the length of prompts and stimuli to the minimum required length, [as appropriate for the CCSS in that grade level.]
- Avoid sentences with multiple clauses [**in** items/prompts/directions/questions/stems.**]**
- Use a series of simpler, shorter sentences in place of longer, more complex sentences [**in** items/prompts/directions/questions/stems.**]**
- Use vocabulary and sentence structure that is at or below grade level for prompts and directions, [in accordance with the CCSS.]
- Use vocabulary and sentence structure for prompts and directions that is at grade level when assessing reading skills.
- Use vocabulary and sentence structure that is at or below grade level when assessing skills other than reading.
- Use common words (including academic vocabulary) instead of unusual or low-frequency words.
- Do not use ambiguous words, idioms, or jargon unless they are defined or part of the knowledge being measured.
- Avoid false cognates (words with a common etymological origin), such as "billion," which means the number 1,000,000,000 in English but which means 1,000,000,000,000 in Spanish. [Vendors should avoid false cognates used in languages spoken by more than 10% of the assessed population.]

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[6] Measured Progress/ETS Collaborative. (2012). "Smarter Balanced Assessment Consortium: General Accessibility Guidelines."

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- Do not use words, phrases, names, or terms that may be culturally insensitive or familiar to people of a given culture.
- Avoid irregularly spelled words.
- Avoid proper names unless necessary.
- When a fictional context is necessary (e.g. for a mathematics word problem), use a simple context that will be familiar to the widest possible range of students (such as objects and activities commonly encountered in school).
- Present emphasis words (e.g. essential words) in directions in bold.
- Make prompts as direct as possible and use an active voice.
- Prompts are worded positively and avoid the use of terms like "not," "never," and "except."
- When a prompt references a specific section of a stimulus, include the relevant section with the prompt when possible.
- Do not use extraneous verbiage in answer options.
- Present answer options in the shortest to longest form possible.
- [Where applicable,] make answer options approximately equal in length.
- [Clearly specify the type of response required.]
- [Develop plausible answer options for multiple choice items. Distractors, when necessary, must be plausible.]
- When appropriate for the construct measured, reference visuals in the item/prompt.[7]
- *[For additional guidance, please refer to the PARCC Bias & Sensitivity Guidelines]*

GUIDELINES FOR VISUAL ELEMENTS:

Excerpt from *"Smarter Balanced Assessment Consortium: General Accessibility Guidelines" – Measured Progress/ETS Collaborative*[8]

- Include visual elements only when essential [to the construct measured for mathematics or included in the primary source passages for ELA/literacy.]
- Refer to the visual element in the prompt.
- Present visual elements with clarity and with sufficient contrast.
- Avoid the use of color or grayscale in visual elements unless necessary [to the construct measured.]
- [No item should be designed to be color-reliant.]
- [Provide sufficient spacing between lines (leading).]
- [Follow traditional formatting rules with respect to margins, breaks, and paragraphs, unless indicated otherwise by a primary source material.]
- Include labels and supportive text for all visual elements, unless not indicated in primary source materials.
- Place labels in a consistent location across visual elements when possible.

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[7] Maryland State Department of Education. (2012). "Item Accessibility and Modification Guide."
[8] Measured Progress/ETS Collaborative. (2012). "Smarter Balanced Assessment Consortium: General Accessibility Guidelines."
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- Avoid multimedia or interactive features unless they are absolutely required to measure the targeted knowledge, skill, or ability, as indicated in the CCSS.
- [When possible, place visual elements in proximity to text that references or clarifies the element.]
- [Design visuals such that when magnification is applied, the visual is still easily read and understood.]
- [All graphics must be compliant with section 508 guidelines.]
- [Graphics/figures/tables, etc. should be adapted as necessary to provide later accessibility (e.g. braille support), provided the construct of the item does not change.]

"UDL Guidelines"[9]

Images, Graphics, Animations, Video, **or Text** (see below) are often the optimal way to present information, especially when the information is about the relationships between objects, actions, numbers, or events. But such visual representations are not equally accessible to all learners, especially learners with visual disabilities or those who are not familiar with the type of graphic being used. Visual information can be quite dense, particularly with visual art, which can have multiple complex meanings and interpretations depending on contextual factors and the viewer's knowledge base. To ensure that all learners have equal access to information, it is essential to provide non-visual alternatives.

Implementation Examples:
- Provide descriptions (text or spoken) for images, graphics, video, or animations across the range of standards such that forms for students with visual impairments can be populated. This would be considered a picture description or closed captioned, which is part of section 508 accessibility guidelines; States currently provide this to students with visual impairments.
- Use touch equivalents (tactile graphics or objects of reference) for key visuals that represent concepts across the range of standards such that forms for students with visual impairments can be populated.
- Provide auditory cues for key concepts and transitions in visual information. (Falls under section 508 accessibility guidelines.)

Text is a special case of visual information. The transformation from text into audio is among the most easily accomplished methods for increasing accessibility. The advantage of text over audio is its permanence, but providing text that is easily transformable into audio accomplishes that permanence without sacrificing the advantages of audio. Text-To-Speech is increasingly effective but still disappoints in its ability to carry the valuable information in prosody. The method of offering text-to-speech (human recording, automated software, etc.) is still under discussion across PARCC states.

Implementation Examples:
- Follow accessibility standards as indicated by the technology architecture (such as NIMAS, DAISY, etc.) when creating digital text.

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[9] CAST (2011). *Universal Design for Learning Guidelines version 2.0.* Wakefield, MA: Author.
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- Allow for a competent aide, partner, or "intervener" to read text aloud.
- Provide access to text-to-speech software.

GUIDELINES FOR AUDITORY ELEMENTS:

"UDL Guidelines"[10]

Sound is a particularly effective way to convey the impact of information, which is why sound design is so important in movies and why the human voice is particularly effective for conveying emotion and significance. However, information conveyed solely through sound is not equally accessible to all learners and is especially inaccessible for learners with hearing disabilities, for learners who need more time to process information, or for learners who have memory difficulties. In addition, listening itself is a complex strategic skill that must be learned. To ensure that all learners have access to learning, options should be available for any information, including emphasis, presented aurally.

> ***Implementation Examples: (PARCC policy on format and implementation is still under discussion.)***
> - Use text equivalents in the form of captions or automated speech-to-text (voice recognition) for spoken language.
> - Provide visual diagrams, charts, notations of music or sound.
> - Provide written transcripts for videos or auditory clips.
> - Provide signing support for spoken English.
> - Use visual analogues to represent emphasis and prosody (e.g., emoticons, symbols, or images).
> - Provide visual or tactile (e.g., vibrations) equivalents for sound effects or alerts.
> - Provide visual and/or emotional description for musical interpretation.
> - *[Note: These accessibility supports will be provided across the range of standards such that forms for students with hearing impairments can be populated.]*

For specific guidelines on tactile graphics, please refer to the American Printing House for the Blind, Inc. Test Access Guidelines for Computer Administered Testing[11].

GUIDELINES FOR LAYOUT DESIGN/FORMATTING:

Note: Item developers are expected to collaborate with the vendors developing the technology architecture around issues related to access.

As a best practice within the item layout design/formatting process, item developers should assure that items and item components are described in conformance to *PARCC Metadata Guidelines [link to document when available]* and *PARCC Interoperability Guidelines [link to document when available]*, and

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[10] CAST. (2011). *Universal Design for Learning Guidelines version 2.0.* Wakefield, MA: Author.

[11] Ilan, J. M., Bulla, N. and Goodman, S.A. (2003). Test Access: Guidelines for Computer-Administered Testing. American Printing House for the Blind: Louisville, KY. Available from: http://www.aph.org.

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that this descriptive information is provided at the time of item submission and updated as items are revised.

Excerpt from *"Smarter Balanced Assessment Consortium: General Accessibility Guidelines" – Measured Progress/ETS Collaborative*[12]

- [To the extent possible,] design items and sections of tasks such that their entire content can be displayed on a single screen.
- When possible, avoid stimuli that cannot be displayed on a single screen.
- When stimuli extend beyond one page, present stimuli as multiple pages instead of as an extended scroll box.
- [When possible,] place visual elements in proximity to text that references or clarifies the element.
- Avoid crowding of details.
- Use consistent naming and graphic conventions across all items.
- Avoid text, including labels, printed on shaded areas.
- Avoid long labels containing more than 2 to 3 words, [unless necessary to the construct measured.]
- Avoid labels that are vertical, slanted, or anything other than horizontal.
- Avoid the use of all capital letters for extensive text.
- Avoid labels or other text in italics, handwriting, or decorative typeface, [unless required to meet conventions (e.g. italics for book titles and mathematics equations).]
- Avoid labels (e.g. on maps) that are too small or that are irrelevant.
- Avoid labels that contain letters that are not clearly distinguishable by sound (e.g., avoid using S and X in the same item).
- Avoid labels that contain letters that are not easily distinguishable from each other by sight (e.g., O and Q).
- Avoid invented or nonstandard symbols that have no equivalent in braille.
- Avoid symbols whose meaning or pronunciation is not obvious, [unless necessary to the construct measured.]
- Avoid tables with many columns and/or rows, unless necessary to the construct measured.
- Include column and/or row headers that are appropriate for the data presented in a table.
- Introduce all stimuli prior to presenting stimuli and inform students what they are expected to do with the stimuli
- Include line numbers for poems and narrative stimuli when items refer to the content in the poem or narrative stimuli.

"UDL Guidelines"[13]
- Display information in a flexible format so that the following perceptual features can be varied:
    - The size of text, images, graphs, tables, or other visual content
    - The contrast between background and text or image

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- o   The color used for information or emphasis
- o   The volume or rate of speech or sound
- o   The speed or timing of video, animation, sound, simulations, etc.
- o   The layout of visual or other elements

The content above indicates the general guidelines for writing accessible items for the PARCC assessment system. It is essential that item development writers have a deep knowledge of the intricacies of the CCSS, the assessment claims, and the construct measured for each item/task. Careful judgment in applying these accessibility guidelines will drive the writing of items as opposed to applying the list as a checklist. In the spirit of Universal Design, accessible item writing is not driven by a one-size-fits-all model, but instead a careful design process with the ultimate goal of opening up access to as many students as possible without the need for individualized adaptation of the assessment experience.

TEST DELIVERY SYSTEM REQUIREMENTS

INTERFACE:

Excerpt from *"Smarter Balanced Assessment Consortium: General Accessibility Guidelines"* – *Measured Progress/ETS Collaborative*[14]

Below, several design features for a digital assessment delivery interface are listed.

- The item and task presentation and work space is centrally located and its size is maximized.
- The default contrast should aim to maximize readability of item and task content while minimizing fatigue (black text on an off-white rather than pure white background should be considered as a default setting).
- Navigation buttons—Next Item and Previous Item (for a non-adaptive test)—are always located in the same place and require minimal movement from the item response space.
- Navigation buttons are of an adequate size to be easily located and selected by students with fine motor skills needs.
- Navigation buttons use sufficient contrast between foreground and background so that their text can be read by most readers.
- Use of icons is minimized or accompanied by text on all control elements in order to minimize cognitive load and to support access to button labels in an audio form.
- Text labeling navigation and control buttons make sense out of context (e.g., Next Question instead of Click Here).
- Visual or auditory feedback is provided when mouse or Tab navigation encounters a control element (the type of feedback should be tailored to the student's need).

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[14] Measured Progress/ETS Collaborative. (2012) "Smarter Balanced Assessment Consortium: General Accessibility Guidelines."

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- Extraneous information (e.g., Student Name, Test Name) not specific to the current item is minimized and presented in a manner that does not distract students from the item or task content.
- All tools and manipulatives are presented in a single space/alley, and only those tools required for the current item are available.
- Tools and manipulatives are designed to minimize covering item and task content when opened.
- [In addition to accessibility supports for all students, the availability of embedded accommodation] supports is customized based on each student's needs in order to minimize distraction and maximize accessibility of the items and tasks.]
- All accessibility tools available to a student can be activated or deactivated by the student.
- Use of color for interface design elements is minimized, colors that are not distracting are used for nonessential elements, and colors must provide sufficient contrast with other elements so that information provided by color is readily apparent to most test takers.
- All elements of the interface can be controlled using "Tab-Enter" navigation allowing interaction with any dual switch input device.
- The ability to magnify or zoom-in on item content is provided for all students.
- Supports such as note-taking and graphic organizers are available to students. Which graphic organizers students can use must be vetted by PARCC.
- Tools that allow students to eliminate response options and/or to highlight portions of an item are available to all students.
- [Stimulus and response options are viewable on one screen when possible.]
- [Page layout is consistent throughout the assessments, unless changes are necessary to measure the specific construct.]

EMBEDDED SUPPORTS

"Embedded Supports" – Dave Edyburn[15]

For development purposes the following definitions are provided concerning constructs associated with embedded supports:

A **tool** serves a general purpose; such as a hammer, notepad, or calculator. It is expected that the user will know **when** it is appropriate to use a specific tool (a hammer vs. a screw driver) and generally **how** the tool works (that is, it does not require specialized training). Tools are readily accessible on-screen and may be stored in a palette to preserve screen space.

A **support** is a **context-specific performance aid**. Hence some directions may need to be provided concerning how this type of aid can be used. Spell checking may be a tool that is provided in workspaces that involve writing but disabled in contexts that involve mathematical problem solving. A K-W-L graphic organizer could be provided as a specialized notepad as students read a passage. Avatars could have different personalities and/or functions (e.g., a personal assistant could be called upon to turn my

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[15] Edyburn, D. (2011) "Embedded Supports." University of Wisconsin-Milwaukee.
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dictation into text or a peer avatar could be available to give strategy advice on how to get started or offer hints about how to think about a problem solving strategy).

A **scaffold** is a *support that is provided initially but subsequently faded* and withdrawn. Training wheels are often considered a scaffold as they help a beginning/novice bike rider but subsequently become unnecessary. Scaffolds and supports are identical with the exception of the expectation for how long it will be used (temporarily vs. always). An example of a scaffold might be the availability of a pedagogical agent that provides direct instruction or feedback on initial performance but is disabled after the completion of the first few items.

A **link** is *a hypermedia feature* that allows the student to access a definition, audio pronunciation, graphic representation, etc. Such links are embedded in text and signal a way for students to get more information about a term or concept.

A **preference** is *a feature that can be changed by the user* but is thought to be irrelevant to performance (e.g., choice of writing with a pen with blue ink or a pen with black ink on the quality of a written essay). Examples of a preference could include allowing the user to: enlarge the font size, alter the line spacing, alter the leading (space between lines) and margins, change the font color, alter the background color, and/or customize the characteristics of an avatar. Often it is useful to have students interact with the system to select preferences before a time task begins. Preferences should be linked with the learner profile and stored for use across subtests and/.or sessions.

An **embedded support** refers to *any tool, support, scaffold, link, or preference that is built into the assessment system* with the explicit expectation that the feature will help many diverse students, some whom we cannot predict in advance will use and benefit from the support. Embedded supports will be readily available individually on-screen, stored in a tool palette, or accessible through a menu or control panel as needed. To the extent possible, supports will be consistent through subtests. When an embedded support is made available to all users, it is considered a universal design intervention. When a support is made available to only a subset of users based on their learner profile, it is considered an accessibility feature.

Engagement. A key issue impacting the reliability and validity of an assessment is whether or not the student actively engages in the assessment tasks. As a result, several metrics of engagement should be developed that reflect a students' active engagement in the digital assessment. One particular line of inquiry should focus on embedding options for getting help (which is routinely discouraged in traditional paper and pencil assessment environments). For example, consider the array of Lifelines that have been created as part of the game show, *Who Wants to be a Millionaire*? (http://en.wikipedia.org/wiki/Who_Wants_to_Be_a_Millionaire%3F#Lifelines). Providing a small collection of interesting just-in-time help features could serve to sustain student engagement and provide value-added data concerning student persistence and performance after they encounter gaps in their knowledge. Obviously, such interventions will also require appropriate changes in scoring and

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perhaps dynamic norming considerations to analyze performance across different groups that used different types of lifelines (help) features.

Design of Embedded Supports

Test developers are also encouraged to consider how technology tools are readily available and used in real-world settings. For example, typing in a Google search box reveals a feature of word completion (also known as word prediction). Such an application, once considered to be a specialized form of assistive technology needed only by some individuals, now has application for diverse mainstream populations. Therefore, technologies readily available in real-world settings should be embedded into large-scale assessments.

Finally, embedded supports must be designed with careful attention to accessibility. Whereas the addition of audio may be useful for students with learning disabilities or students who first language is not English, audio is inaccessible for students who are deaf. Therefore, alternative access must be designed (in this case, a transcript of the audio needs to be available). Similarly, not all students will be able to use the keyboard. This means that they may be taking the assessment with the use of a screen reader or a switch. Therefore, alternative access methods must be made available through intentional efforts to implement principles of universal design rather than creating a need for individual accommodations.

Excerpt from *"Smarter Balanced Assessment Consortium: General Accessibility Guidelines"* – *Measured Progress/ETS Collaborative*[16]

Magnification
- A tool that allows students to magnify selected areas of an item (e.g., a digital magnifying glass).

- An interface that magnifies all item and task content up to at least 8x. This form of magnification may move some content off screen and must allow a method for students to "slide" content on the screen.

- An interface that magnifies all item and task content up to at least 8x and which places the focal point in a fixed location. This interface functions like a microscope and may be useful for students with very low vision and/or a limited field of vision.

- Note that changing font size is not recommended, as it may affect layout and location of text in an unpredictable manner. An alternative is to provide multiple predefined text display sizes, each of which have been subjected to quality assurance testing to assure that each text display size option does not alter layout and location of text in an undesired manner.

Contrast

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[16] Measured Progress/ETS Collaborative. (2012). "Smarter Balanced Assessment Consortium: General Accessibility Guidelines."
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- A feature that allows the contrast of item content to be reversed (e.g., content that is presented as black on off-white by default is reversed such that it is off-white on black).

- A tool that allows students to select specific foreground and background colors.

- A tool that allows students to select a color overlay/tint that is placed over all item or task content.

Auditory Calming *(under consideration by PARCC)*
- A tool that allows students to select and play background noise and/or music.

Masking
- A tool that allows students to mask portions of an item or task and selectively unveil additional portions of an item or task.

Line Reader
- A tool that allows students to highlight and/or mask a single line of item or task content and to move the tool up or down the screen to assist in reading individual lines of text.

Glossary
- A tool that allows students to view glossary terms for a specific word or phrase.

"PARCC Embedded Supports" – Cara Laitusis, Mike Russell, Linda Zimmerman, Ellen Strain Seymour[17]

[Some of the embedded supports listed below will be used as embedded accommodations for those students who require additional support as indicated in their Individualized Education Plan (IEP) or 504 Plan. The embedded supports are indicated with an asterisk and will be outlined in detail in the *PARCC Common Accommodations Manual.* This is the process of being developed and will be shared at a later date. PARCC is committed to including the following embedded supports in its End-of-Year and Performance-Based Assessments:]

- **Screen readers text-to-speech/speech-to-text software ***
  o PARCC assessments will be developed to be compatible with text-to-speech (reading access accommodation) and speech-to-text (writing access) software. Official PARCC policies on the use of reading and writing access accommodations are outlined in the *PARCC Common Accommodations Manual.*

- **Font size/graphic enlargement**

- **Choice of background/text color [effective color contrast]**

- **Highlight critical features**
  o With this embedded support, all students will have access to a technology-enhanced highlighter to use when reading items, prompts, passages, etc.

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[17] Laitusis, C., Russell, M., Zimmerman, L., and Strain, E. (2012). "PARCC Embedded Supports."
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- **Graphic organizers or representations ***
  - o Students who require a graphic organizer when taking an assessment, as indicated on their IEP or 504 Plan will have an electronic bank of PARCC-approved graphic organizers to choose from when accessing certain portions of the assessments.

- **Customized dictionary or other home language supports/tools**

- **Embedded/pop-up glossary**

- **Reducing visual distractions surrounding written text**

- **Captions for audio**

- **Option response: adapted keyboards, StickyKeys, MouseKeys, etc.**
  - o Items will be written such that with the use of assistive technology, students with access needs will be able to demonstrate what they know and can do on the PARCC assessments.

- **Customized timing**

- **Braille printing or refreshable Braille devices**

- **Signing support**

ACCESS AND OPTIONS FOR DELIVERY AND RESPONSE METHOD

Information on the following accommodations will be provided to vendors upon finalizing policies. This information will be helpful, but the absence of this information will not inhibit item development.

- Spoken presentation of item and task content
- Braille support
- Signed translation (signing support)
- Tactile graphics
- Format for text-to-speech and speech-to-text
- Language translation

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Table 1. Plain Language Editing Strategies[18]

Strategy	Description
Reduce excessive length	Reduce wordiness and remove irrelevant material.
Use common words	Eliminate unusual or low frequency words and replace with common words (e.g., replace "utilize" with "use").
Avoid ambiguous words	For example, "crane" should be avoided because it could be a bird or a piece of heavy machinery.
Avoid irregularly spelled words	Examples of irregularly spelled words are "trough" and "feign."
Avoid proper names	Replace proper names with simple common names such as first names.
Avoid inconsistent naming and graphic conventions	Avoid multiple names for the same concept. Be consistent in the use of typeface.
Avoid unclear signals about how to direct attention	Well-designed heading and graphic arrangement can convey information about the relative importance of information and order in which it should be considered.
Mark all questions	Give an obvious graphic signal (e.g., bullet, letter, number) to indicate separate questions.

 Source: Brown (1999).

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[18] Brown (1999).

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Table 2. Dimensions of Legibility and Characteristics of Maximum Legibility[19]

Dimension	Maximum Legibility Characteristics
Contrast	Black type on matte pastel or off-white paper is most favorable for both legibility and eye strain.
Type Size	Large type sizes are most effective for young students who are learning to read, students with visual difficulties, and individuals with eye fatigue issues. [Enlarged print = 14-16 point; Large print = 18 point]
Spacing	The amount of space between each character can affect legibility. Spacing needs to be wide between both letters and words. Fixed-space fonts seem to be more legible for some readers than proportional-spaced fonts.
Leading	Leading, the amount of vertical space between lines of type, must be enough to avoid type that looks blurry and has a muddy look. The amount needed varies with type size (for example, 14-point type needs 3-6 points of leading).
Typeface	Standard typeface, using upper and lower case, is more readable than italic, slanted, small caps, or all caps.
Justification	Unjustified text (with staggered right margin) is easier to see and scan than justified text especially for poor readers.
Line Length	Optimal length is about 4 inches or 8 to 10 words per line. This length avoids reader fatigue and difficulty locating the beginning of the next line, which causes readers to lose their place.
Blank Space	A general rule is to allow text to occupy only about half of a page. Blank space anchors text on the paper and increases legibility.
Graphs and Tables	Symbols used on graphs need to be highly discriminable. Labels should be placed directly next to plot lines so that information can be found quickly and not require short-term memory.
Illustrations	When used, an illustration should be directly next to the question for which it is needed. Because illustrations create numerous visual and distraction challenges, and may interfere with the use of some accommodations (such as magnifiers), they should be used only when they

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[19] Thompson, Thurlow, and Malouf (2004). Universal Design in Educational Assessments by William D. Schafer & Min Liu University of Maryland

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	contain information being assessed.
Response Formats	Response options should include larger circles (for bubble response tests), as well as multiple other forms of response.

Source: Thompson, Thurlow, and Malouf (2004).

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